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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,785	06/27/2005	Atsushi Miyake	SUGI-102US	2095
23122	7590	06/20/2007	EXAMINER	
RATNERPRESTIA			COOK, JONATHON	
P O BOX 980			ART UNIT	PAPER NUMBER
VALLEY FORGE, PA 19482-0980			2886	
MAIL DATE		DELIVERY MODE		
06/20/2007		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/540,785	MIYAKE ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Jonathon D. Cook	2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 27 June 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-12 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 27 June 2005 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/27/2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## Detailed Action

### Specification Objection

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and

descriptive, preferably from two to seven words may not contain more than 500 characters.

- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in

general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing: See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

The disclosure is objected to because of the following informalities:

The titles of the sections need to conform to the above;

The claim to priority to the PCT/JP03/16015 needs to be amended into the first line of the specification as under CFR 1.78 or submitted into the application data sheet as under CFR 1.76.

Appropriate correction is required.

### **Claim Objection**

Claims 1, 2, 4, 5, 7, 8, 10, & 11 are objected to because of the following informalities:

In **claim 2** at the end of the 3<sup>rd</sup> line after the word comprising there should be a ‘:’;

**In claims 1, 2, 4, 5, 7, 8, 10, & 11**

the limitation  $Xn \pm \alpha$  CCD pixels lacks proper antecedent basis;

the limitation, “calculating a plurality of types of sine wave deviated in phase at 90°...” should read, “calculating a plurality of types of sine waves that are deviated in phase at 90°...”;

Appropriate correction is required.

### **Claim Rejections - 35 USC § 112**

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1, 2, 4, 5, 7, 8, 10, & 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **Claims 1, 2, 4, 5, 7, 8, 10, & 11**, the applicant claims that  $Xn \pm \alpha$  CCD pixels correspond to n grids. This limitation is indefinite because the variable X is not defined. For purposes of prosecution the examiner will interpret  $X = 4p$ , where p is an integer of 1 or more as is stated in dependent claims 3, 6, 9, & 12.

### **Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

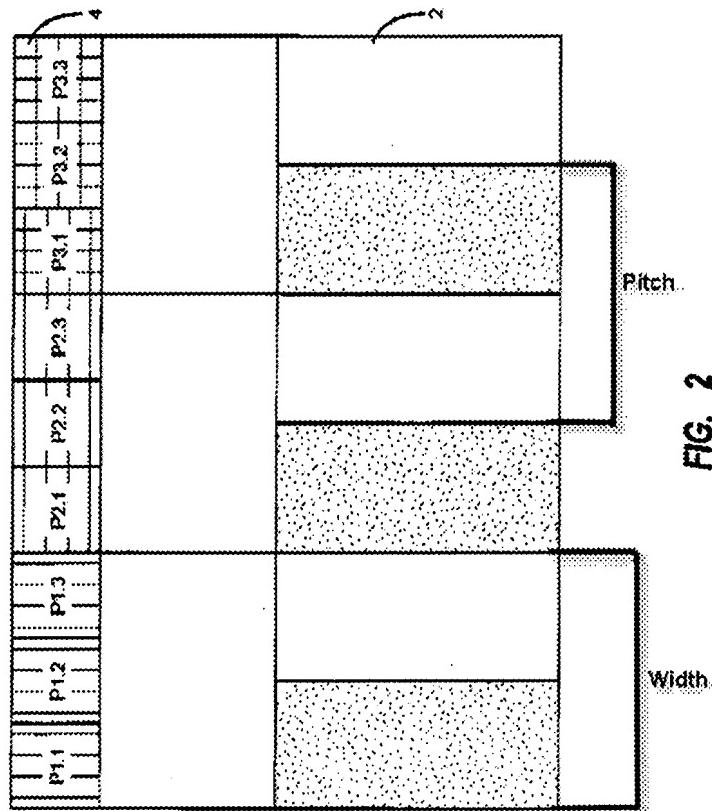
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 4-6 & 10-12 rejected under 35 U.S.C. 102(b) as being anticipated by **Pingel et al (WO98/17993)** (Pingel).

Regarding **Claims 4-6 & 10-12**, Pingel discloses and shows in **figs. 1 & 2** an estimating method of the amount of optical distortion of light transmitted through a windshield (3) (applicant's transparent glass member) with unevenness of refractive power of the windshield, comprising:

*a step of picking-up an image of a grid pattern having an array having a bright portion and a dark portion with a constant pitch and a constant width (see modified figure 2 below) by using an image pickup device and enabling  $Xn \pm \alpha$  CCD pixels to correspond to n grids, thereby generating  $\alpha$  moire fringes, upon picking-up the image of the grid pattern on said image pickup device,*

The moire image which is detected on the camera results from superimposition of two brightness distributions with a specific periodicity, in which case the approximate profiling of sinewave of the moire structure can be recognized on the "grid" of pixels over the width of a line pair of the sequence which corresponds to a light/dark period  
**(Page 3, 4<sup>th</sup> Paragraph);**



in the above illustration three pixels correspond to one pair of dark and light areas. In the applicant's disclosure  $X = 4p$  ( $p = 1$  or more), in the above illustration each dark and light pair would produce one moire fringe so  $\alpha=1$ , therefore if  $p=1$  the limitation is met;

*a step of processing, by image processing means, gray image data of the grid pattern picked-up by said image pickup device via said transparent plate member,*

*step of processing by the image processing means comprises:*

*a step of calculating a plurality of types of sine waves that are deviated in phase at  $90^\circ$  from image data of said moiré fringes,*

it is advantageously possible to use the value of the second and third pixels as the value for the record shifted through  $120^\circ$  and  $240^\circ$  (or  $-120^\circ$ ). These moire image strips, offset through  $120^\circ$  (one third of a complete sine wave) and detected by the pixels of the camera can, after simple conversion, be expressed mathematically as curves that are dependent on a sine function (**Page 3, 5<sup>th</sup> paragraph**) and,

if the number of pixels associated with a light/dark pair is increased, by a factor of, for example, four (five) or more, this allows an evaluation to be carried out using a phase-shift method shifted in each case by  $90^\circ$  (**Page 3, 8<sup>th</sup> Paragraph**);

*a step of obtaining a phase angle at each pixel based on said plurality of types of sine waves, and*

*a step of calculating refractive power of the optical distortion based on the difference in phase angles between the pixels,*

Variations in the refractive power of the panes, for example a windshield of a motor vehicle, lead to variations in the maxima and minima which occur as a result of the moire phenomenon and can easily be determined as a phase shift (applicants difference in phase angles) in the sine wave; if the distance between the camera and the pane is known, this can be used to determine the angle through which the light that passes through the pane is refracted (**Page 3, Paragraphs 6 & 7**). Thus meeting the limitations of a means for obtaining a phase angle at each pixel based on a plurality of types of sine waves, and calculating the refractive power or angular deviation of an optical distortion, such as a chipped portion;

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3 & 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Pingel** in view of **Minato** (US PAT 5,216,481) (**Minato**).

Regarding **Claims 1-3 & 7-9** Pingel discloses and shows in **figs. 1 & 2** an estimating apparatus of the amount of optical distortion of light transmitted through a windshield (3) (applicant's transparent plate member) with unevenness of refractive power of the transparent plate member, comprising:

*a light source (1) (applicant's means for irradiating) for illuminating a grid pattern (2) having an array of bright portions and dark portions with constant pitch and a constant width (see modified **figure 2** above);*

*Camera (4) (applicant's means for picking-up said grid pattern);*

*means for inputting a signal from said image pickup device, as gray image data, another approach to further processing of the lighting pattern, which is preferred*

owing to its very good resolution, is to use the moire image that occurs on the pixels of the camera. The moire image which is detected on the camera results from superimposition of two brightness distributions with a specific periodicity (**Page 3, 4<sup>th</sup> Paragraph**). Thus if the data being recorded by the camera is being processed it has been inputted, and since brightness distribution is what matters for this method it would be obvious to use "gray" image data;

$Xn \pm \alpha$  CCD pixels corresponding to  $n$  grids (see modified **figure 2** above), in the above illustration three pixels correspond to one pair of dark and light areas. In the applicant's disclosure  $X = 4p$  ( $p = 1$  or more), in the above illustration each dark and light pair would produce one moire fringe so  $\alpha=1$ , therefore if  $p=1$  the limitation is met;

*image processing means comprising:*

*means for calculating a plurality of types of sine waves that are deviated in phase at 90° from image data of said moiré fringes,*

it is advantageously possible to use the value of the second and third pixels as the value for the record shifted through 120° and 240° (or -120°). These moire image strips, offset through 120° (one third of a complete sine wave) and detected by the pixels of the camera can, after simple conversion, be expressed mathematically as curves that are dependent on a sine function (**Page 3, 5<sup>th</sup> Paragraph**) and,

if the number of pixels associated with a light/dark pair is increased, by a factor of, for example, four (five) or more, this allows an evaluation to be carried out using a phase-shift method shifted in each case by 90° (**Page 3, 8<sup>th</sup> Paragraph**);

*means for obtaining a phase angle at each pixel based on said plurality of types of sine waves, and*

*means for calculating refractive power of the optical distortion based on the difference in phase angles between the pixels,*

Variations in the refractive power of the panes, for example a windshield of a motor vehicle, lead to variations in the maxima and minima which occur as a result of the moire phenomenon and can easily be determined as a phase shift (applicant's difference in phase angles) in the sine wave; if the distance between the camera and the pane is known, this can be used to determine the angle through which the light that passes through the pane is refracted (**Page 3, Paragraphs 6 & 7**). Thus meeting the limitations of a means for obtaining a phase angle at each pixel based on a plurality of types of sine waves, and calculating the refractive power or angular deviation of an optical distortion, such as a chipped portion;

Pingel fails to disclose a means for supporting and conveying said transparent plate member in an optical line ranging from said grid pattern to said image pickup device;

However, Minato teaches and shows in **fig. 2** an apparatus for inspecting transparent objects for defects, comprising:

a conveyor (3) (applicant's means for supporting and conveying) for transporting to an inspecting position a transparent glass;

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Pingel with the conveyor for advantages

such as the automation of inspection to ensure consistent distance between the camera and glass, and to improve throughput of the inspection process.

## Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. If applicant has trouble understanding the Pingel citation relied on examiner notes the US PAT 6,509,967 is an exact translation of the citation and may be of use in understanding the document.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathon D. Cook whose telephone number is (571)270-1323. The examiner can normally be reached on Mon-Fri 9:00am to 5:30pm.

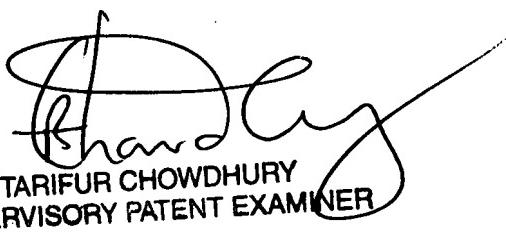
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on (571)272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2886

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jonathon Cook  
Patent Examiner  
AU: 2886  
June 14<sup>th</sup>, 2007

J.C.



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SUPERVISORY PATENT EXAMINER